Arizona";[2] and, in said article, the Cretaceous formation receives mention as follows:[3]

The Cretaceous.—About twenty-six miles northwest of Fort Apache near Forestdale (not far from Pinedale mentioned in the article above) a coal outcrop is exposed, which seems on lithological grounds, to be the same as the Fort Union or Laramie coal of New Mexico. The extent of this coal series is not known to the writer as it is almost everywhere covered with later deposits.

ALBERT B. REAGAN

NETT LAKE, MINN.

THE SECOND RECORD FOR BLANDING'S TURTLE IN CONCORD, MASS.

As curator of the Thoreau Museum of Natural History, Middlesex School, Concord, Mass., I have just received a specimen of Blanding's turtle [*Emys Blandingii* (Holbrook) Strauch] caught by W. A. Patch on July 19, 1911, in the Concord River, off Dakin's Hill. The specimen was given me by Mr. John Hoar, and is peculiar in that it has a large growth beneath the chin. The only other Concord record is of a specimen taken by Thoreau in the same river, and now (only carapace and plastron) preserved (No. 454) in the Boston Society of Natural History.

R. HEBER HOWE, JR.

SCIENTIFIC BOOKS

The Biological Stations of Europe. By CHARLES ATWOOD KOFOID. United States Bureau of Education; Bulletin, 1910, No. 4. Pp. 360. Washington.

The biologist of sixty and seventy years ago labored under difficulties that the present generation can hardly appreciate. The facilities for work were scarce; books and apparatus of all sorts were hard to obtain; there were no laboratories of any kind with the exception of the dissecting rooms of the medical schools. Little was known of methods of study of marine life. To be sure, one could wander along the shore, picking up the forms living between tides, and could preserve them in a bottle of new rum, but for the species living below low-water mark the student and collector had to depend upon the wreckage thrown up by storms or upon the contents of the stomachs of fishes. The latter method was employed by Dr. Stimpson in obtaining the material for his work upon the shells of New England, and, while looking over fish refuse for this purpose, was stoned as a crazy man by the boys of Marblehead. It was not until a few years later that the late Dr. Henry Wheatland, of Salem, constructed the first naturalist's dredge ever used in America and initiated Stimpson into a line of work which he turned to such good account while acting as naturalist of the Ringgold-Rogers expedition to the North Pacific Ocean.

The student of to-day has everything ready at hand. From the moment he enters the laboratory as an undergraduate until his doctor's dissertation is accepted, everything he needs in the material line is placed before him —specimens, books, apparatus—and all of his time and all of his energies can be devoted to his problem. Then when he goes to the shore for his investigations he is no longer compelled, like Johannes Müller, the father of marine biology, to depend upon the limited facilities of a fisherman's hut. He finds, in almost every region of the globe, a biological station equipped with every requisite for his work. In the evening he states his needs for the next day—animals, apparatus, chemicals —and the next morning he finds these ready in the well-equipped study set aside for his exclusive use.

Whether this is best in every respect for the student is a question. It is often remarked that the younger men have no such acquaintance with the animals and plants, their systematic position, names and habitats, that the older men had, and this lack of knowledge of one aspect of nature is in large measure due to the lack of any necessity of hunting the specimens. A little less helpfulness on the part of the laboratory collector would result in a better acquaintance with life and living things.

Be this as it may, the fact remains that biological stations are with us and they are

[2] *American Geologist*, Vol. XXXII., pp. 265–308.

[3] *Ibid.*, p. 280.

bound to stay and to increase in number and in extent of the facilities they afford. Already there are about a dozen permanent laboratories located upon our two coasts, while there are several more upon our inland waters. But it is in Europe that these stations have their greatest development, and it is of these that Dr. Kofoid has given a most valuable account.

The arrangement of his book is geographical and quite naturally begins with the celebrated Stazione Zoologica of Naples, despite the fact that the station at Concarneau (France) was the first permanent laboratory to be located on the shore (1859). Then follow, in order, the laboratories of France, Great Britain, Germany, Austria-Hungary, Scandinavia, Holland, Belgium, Spain, Finland, Russia and Bulgaria. Of each a history is given, usually illustrated with photographs and plans, of great value to all who have to do with the planning, equipment and management of biological stations in any part of the world. The volume will also be of great use to those who wish to avail themselves of the facilities of these stations, for it gives lists of the officials, conditions on which workers are admitted, lists of instruments and apparatus available, extent of libraries, and states whether price lists of specimens for sale are issued.

Especially valuable to all who have to do with laboratories, whether of biological stations or of our high schools and colleges, are the notes upon aquaria and the different methods of their construction, the pumps, tubing, valves and tanks of the water supply, and the different methods of aerating water and the rearing of larvæ and other forms. Thus we are told the composition of the Naples aquarium cement (equal parts of whiting and red lead, made into a stiff putty with boiled linseed oil) and the value of the "mastic de Cette," used for the same purpose.

In connection with many of the stations a statement is made of the annual expenditure within recent years, from which we learn that the running expenses of the Naples station are about $40,000; Helgoland, $18,000; Plymouth, $15,000; the Helder, $10,000, and so on down to Concarneau and Bergen with a budget of $1,500 each and Port Erin and Wimereux with a little over $1,000. Others probably have even less.

In all about eighty marine and fresh-water stations are described, many of them from personal knowledge on the part of Dr. Kofoid, and others from the publications. Besides there are accounts of other institutions which are not laboratories of the same type, but, like the Challenger office, are connected with the investigation of marine life and other problems of oceanography, or like the various fisheries bureaus, are concerned with economic problems. A good bibliography, to which references are made in the text, concludes the volume. J. S. K.

Charts of the Atmosphere. By ABBOTT LAWRENCE ROTCH and ANDREW H. PALMER. New York, John Wiley & Sons. 1911. Oblong 4to, cloth.

More than half a century ago Lieutenant Maury, of the United States Navy, rendered an invaluable service to mariners by his extended observations of ocean currents. The work which he began is still being carried on, with the result that from year to year new knowledge is gained concerning those aids and hindrances to navigation.

We now have in aerial research something analogous to the marine work of Maury.

In 1885, Abbott Lawrence Rotch—now professor of meteorology in Harvard University—founded the Blue Hill Meteorological Observatory. This is situated on the summit of a hill a few miles south of Boston and is 625 feet above sea level. The summit is less than eight miles from the coast line and is the highest elevation, so situated, between Maine and Florida. The observatory is a prominent feature in the landscape and may be seen eastward from Providence-Boston trains about fifteen minutes before reaching the latter city.

From the time of the foundation to the present, meteorological phenomena have there been continuously observed and recorded. The work still goes on.

From the beginning Professor Rotch realized that the elusive problems which ever con-